

Obstructive Jaundice in Patients With Pancreatitis Without Associated Biliary Tract Disease

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Jaundice occurring in patients with pancreatitis is usually due to hepatocellular injury or to associated biliary tract disease. Common duct obstruction is occasionally caused by pancreatic fibrosis, edema or pseudocyst in patients who have neither hepatocellular injury nor biliary tract disease. We have studied 7 patients with obstructive jaundice due to pancreatitis who demonstrated no other known cause for jaundice. The difficulty in making the differential diagnosis between benign and malignant disease in these patients, particularly when no pain is associated with obstructive jaundice, is discussed. In view of the fact that the terminal common duct traverses the pancreas, it is uncertain why obstructive jaundice associated with chronic pancreatitis does not occur more often unless the condition is sometimes transient and overlooked. Operative intervention is required in those patients in whom jaundice is persistent. Operation is intended to decompress the biliary tract and the pancreas. The approach used will be dictated by the operative findings in each patient.

APPROXIMATELY 20% of patients with pancreatitis have jaundice. Jaundice associated with pancreatitis in the absence of choledocholithiasis usually is related to hepatocellular involvement; however, the coexistence of obstructive jaundice and pancreatitis is a recognized phenomenon.

The 7 patients presented in this paper (Table 1) demonstrate the problem of jaundice due to common duct obstruction caused by various forms of pancreatitis in the absence of choledocholithiasis. The judgment made at operation as to whether jaundice is due to obstruction by chronic pancreatitis or cancer involving the head of the pancreas is a critical decision but less so when the patient has pancreatic pain for then a Whipple resection is equally good treatment for both types of disease. On the other hand, the therapeutic decision is more difficult

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when jaundice is painless, for pancreaticoduodenectomy is unnecessary and undesirable therapy for benign pancreatic disease whereas it is the indicated procedure for carcinoma of the pancreas.

Chronic Pancreatitis

Case 1. F. E. was a 53-year-old man. For 3 weeks he had had anorexia, nausea, vomiting, acholic stools, minimal epigastric discomfort, and a 20 pound weight loss. He was a heavy alcohol imbiber.

He was afebrile. The abdomen was distended, non-tender, and the liver was enlarged. The total serum bilirubin was 15.5 mg %.

At operation, the entire pancreas was hard; the head was enlarged; the pancreatic duct was not palpable. The common duct measured 2cm in width. The gallbladder was distended, contained no stones, and was not inflamed. The paraoduodenal lymph nodes showed only inflammatory changes and pancreatic biopsy revealed fibrosis. The body and tail of the pancreas were resected and a pancreaticojejunostomy and cholecystojejunostomy were performed using a Roux-en-Y loop of jejunum. His jaundice did not recur but he died 3 months later with widespread metastatic carcinoma of the pancreas. The pancreas removed at operation revealed chronic pancreatitis and no cancer.

Comments: Severe jaundice and diabetes were the first manifestations of this patient's pancreatic disease. Six weeks after noting jaundice and other vague symptoms he underwent exploratory laparotomy. Gross and microscopic examinations were consistent with chronic pancreatitis. Painless chronic pancreatitis has been emphasized by Goulston² and is usually discovered after the onset of steatorrhea, pancreatic calcification or diabetes; or at the time of autopsy. Painless chronic pancreatitis presenting primarily because of jaundice is rare but has been reported by Weinstein and his collaborators.⁶

All the evidence in this patient suggested the diagnosis of pancreatitis rather than cancer. Our objective at opera-

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TABLE 1. *Patient Summaries*

Case	History	Operative Findings	Operative Diagnosis	Operation	Postoperative Course
1	53 years old with painless jaundice for 4 weeks. Diabetic and alcoholic	Entire pancreas was firm. G. B. was normal but distended	Chronic pancreatitis	Resection of body and tail of pancreas. Roux-en-Y Pancreaticojejunostomy and cholecystojejunostomy	Died in 3 months with disseminated carcinoma of pancreas.
2	38 years old, alcoholic with painful jaundice for one month	Entire pancreas was firm. A small cyst was present in the head. The biliary tract was distended but normal	Chronic pancreatitis	Longitudinal pancreaticojejunostomy using Roux-en-Y limb. T-tube drainage of the common duct	Did well for 6 years. Developed pancreatic insufficiency and died in 7 years
3	76 years old, diabetic who had painless jaundice for 6 months	Enlarged edematous pancreas. The biliary tract was dilated but normal	Acute and chronic pancreatitis	Caudal pancreatectomy with Roux-en-Y pancreaticojejunostomy and cholecystojejunostomy	Pancreaticojejunostomy leaked. Patient expired on 13th postoperative day
4	44 years old, diabetic, alcoholic with pancreatitis and cholelithiasis	Entire pancreas was firm. Single stone in gallbladder	Chronic pancreatitis. Cholelithiasis	Cholecystectomy, Sphincterotomy longitudinal jejunostomy with Roux-en-Y loop	Did well for one year
4	Painless jaundice for 2 weeks	Entire pancreas was firm. Common duct was dilated but normal	Chronic pancreatitis	Choledochogastrostomy	Required ligation of bleeding point at pancreaticojejunostomy. Doing well 7 years after initial operation.
5	62 years old with painless jaundice and suspected pseudocyst that gradually disappeared, also had abdominal aortic aneurysm	Diffuse enlargement and edema of the pancreas and abdominal aortic aneurysm. No pseudocyst	Pancreatitis and abdominal aneurysm	Resection of abdominal aortic aneurysm	Three months later pseudocyst returned
5	62 years old with recurrence of painless jaundice and palpable pseudocyst	10 cm fluctuant mass in head of pancreas. Dilated biliary tract but otherwise normal	Pseudocyst, head of pancreas	Cystoduodenostomy	Has done well for 6 months
6	53 years old with painful jaundice for 2 weeks	8 cm mass in head of pancreas. Dilated biliary tract but otherwise normal	Pseudocyst of head of pancreas	Cystoduodenostomy, Placement of T-tube in common duct	Expired on 10th postoperative day of aspiration pneumonia
7	33 years old, underwent vagotomy and partial gastrectomy. On the 9th postoperative day patient was re-explored for jaundice	Edematous pancreas and saponification of fat. Distended biliary tract but otherwise normal	Postoperative acute pancreatitis	Cystoduodenostomy	Patient became febrile and was re-explored 39 days later for abscess. Patient expired 12 hours later

tion was therefore to preserve as much gland as possible and at the same time satisfactorily decompress the pancreatic and common bile ducts. Distal pancreatectomy with pancreaticojejunostomy and decompression of the biliary system seemed more appropriate than pancreaticoduodenectomy since pain was not the patient's major complaint. It was also preferable to the more difficult lateral pancreaticojejunostomy since multiple stric-

tures of the pancreatic duct did not exist. This patient illustrated the difficulty of distinguishing between cancer and pancreatitis in the presence of painless jaundice and emphasized the fact that both conditions may coexist.

Case 2. T. C., a 38-year-old man, drank one pint of whiskey daily and had been treated previously for acute pancreatitis. One month before admission he developed epigastric pain which penetrated to his back. He became nauseated, was unable to eat, lost 20 pounds and developed progressive jaundice.

He was afebrile but appeared chronically ill. His sclera were icteric. There was tenderness in the epigastrium and left upper quadrant without rebound or guarding. The stool was light brown and the total serum bilirubin was 6.5 mg%.

At operation the entire pancreas was hard and the main pancreatic duct was palpable. The head of the pancreas was enlarged and contained a cyst from which 30 ml of slightly turbid yellow fluid was aspirated. The common bile duct and gallbladder were distended but contained no stones. There was edema and inflammation throughout the lesser sac and multiple lymph node biopsies revealed only hyperplasia. The biliary tract was decompressed easily after the cyst was evacuated. Nevertheless, the common duct was drained with a T-tube. The pancreatic duct was opened longitudinally. It was found to have continuity with the small cyst in the head of the pancreas. Internal drainage of the pancreas was established by a Roux-en-Y lateral pancreaticojejunostomy.

The patient regained weight and was well for 5 years, having abstained from alcoholic intake. At 6 years he complained of weight loss, weakness, anorexia and oily, floating stools. He improved with pancreatic enzymes and a high caloric diet. One year later he died from respiratory and hepatic insufficiency.

Comments: The preoperative diagnostic dilemma in this alcoholic patient was whether his jaundice was related to intrahepatic disease due to alcoholism or to extrahepatic obstruction due to common duct stone, pancreatic inflammation or cancer. He had experienced recurrent episodes of epigastric pain of increasing severity and frequency. Although there is no pain pattern which delineates chronic relapsing pancreatitis from other disease processes, his symptoms prior to operation were consistent with the diagnosis of chronic, alcoholic pancreatitis.

Decompression of the biliary system after the pancreatic cyst was emptied provided adequate evidence that the jaundice resulted from extrahepatic obstruction rather than intrahepatic disease. All indications suggested that the obstruction was due to chronic relapsing pancreatitis although this conclusion was not arrived at without some fear that a concomitant cancer was being overlooked as in the first case. The fact that the patient lived 6 years after surgery provided ample evidence that the extrahepatic block was the result of pancreatitis rather than cancer.

Case 3. J. C., a 76-year-old man, had not used alcohol in 10 years. He had undergone a partial gastrectomy and gastroduodenostomy for benign gastric ulcer 6 years ago. Five and one-half years later he developed weakness, polydipsia, polyuria, a 15 pound weight loss and painless jaundice. The liver was tender to palpation. The patient required 25 units NPH insulin daily. The serum bilirubin rose to 19.5 mg% and the alkaline phosphatase to 42.1 Bodansky units.

At operation the pancreas was enlarged and edematous throughout. The gallbladder and common duct were dilated. A transduodenal needle biopsy of a mass in the head of the pancreas was performed and 25 ml of clear fluid was aspirated. Pancreatic and lymph node biopsies revealed no cancer. A caudal pancreatectomy followed by pancreaticojejunostomy and cholecystojejunostomy were performed using a Roux-en-Y technique. The pancreatic duct in the body of the pancreas communicated with the small cyst. The resected pancreas demonstrated chronic inflammatory changes. On the eight postoperative day the patient was reexplored because of leakage from the pancreaticojejunostomy. He expired 5 days later.

Comments: This man was quite elderly compared to most patients when he manifested his initial symptoms of pancreatitis. This patient, as did the first, presented because of symptoms of diabetes and painless jaundice, and without autopsy confirmation we cannot conclude that he did not have carcinoma of the pancreas as well as pancreatitis. It seems reasonably certain, however, that his pancreatitis was responsible for the obstructive jaundice.

The operative treatment in this patient was distal pancreatectomy with Roux-en-Y pancreaticojejunostomy and cholecystojejunostomy, the same as Case 1. However, the procedure was performed in the presence of significant inflammatory changes throughout the pancreas and adjacent tissues which played a role in the disruption of the pancreatic anastomosis and the patient's subsequent death. In retrospect, with the absence of pain this elderly man was overtreated and could have been managed satisfactorily and probably without mortality by simple decompression of the biliary tree alone.

Chronic Pancreatitis After Biliary Surgery

Case 4. W. H., a 44-year-old alcoholic, had been treated on three previous occasions for acute pancreatitis. Oral cholecystography demonstrated a gallstone. At operation the pancreas was enlarged and firm throughout. The gallbladder, containing a single stone, was removed. A sphincterotomy was done to permit a pancreatogram which demonstrated multiple stenosis with intermittent pooling of dye throughout the length of the duct. A Roux-en-Y lateral pancreaticojejunostomy was performed.

The patient returned to work, gained weight and continued to drink alcohol. He was asymptomatic for one year and then developed painless jaundice. The liver was palpable three fingerbreadths below the right costal margin and was tender. His total serum bilirubin was 26.1 mg %, alkaline phosphatase 31.8 Bodansky units and serum amylase 17 mg %. At reoperation there was a firm mass involving the head of the pancreas and a dilated common duct. There was no evidence of a retained common duct stone. A choledochogastrostomy was performed. The patient is presently 7 years after his original operation. He is working and is asymptomatic.

Comments: This patient had cholelithiasis as well as pancreatitis present at his first operation. We elected to treat both disease processes at the same time. The presence of a stone in the common duct at the ampulla of Vater can explain the coexistence of pancreatic and biliary tract disease, but the association of pancreatitis and a single gallstone in the gallbladder as in this patient may be either fortuitous or have a common, but presently unknown, relationship.

Correction of the biliary tract disease and retrograde decompression of the pancreatic duct did not arrest the progression of the inflammatory disease in the head of the pancreas which ultimately caused obstructive jaundice. The progression of pancreatitis after the gallbladder was removed suggested that it was due to the continued intake of alcohol and completely unrelated to biliary tract disease. Choledochogastrostomy to relieve jaundice was used in this patient for technical reasons. It is not fre-

quently used for this purpose but can be performed without fear of injury to the gastric mucosa.

Pancreatic Pseudocyst

Case 5. C. S., a 62-year-old man, had a long history of excessive alcohol intake and intermittent severe epigastric pain radiating to the right upper quadrant and penetrating to his back, relieved by sitting up and leaning forward. He experienced vomiting and noted acholic stools and jaundice. Total serum bilirubin was 15.9 mg %, alkaline phosphatase 750 IU, and serum amylase was 452 mg %. He had an abdominal aortic aneurysm in addition to a palpable mass in the left upper quadrant which was separate from the aneurysm. The mass disappeared slowly and his jaundice resolved in two weeks allowing the abdominal aortic aneurysm to be resected. At operation the pancreas was diffusely enlarged and edematous without evidence of cystic formation. The gallbladder and common duct appeared normal. Three months later there was a recurrence of epigastric discomfort, jaundice, dark urine and acholic stools. A large palpable epigastric mass was present. The total serum bilirubin was 9.9 mg %, alkaline phosphatase 940 IU, and fasting blood sugar 93 mg %.

Because of persistence of the mass and increasing jaundice surgery was performed. There was a 10 cm cystic mass in the head of the pancreas adherent to the duodenum. The distal pancreas was not abnormal. The common duct was 2 cm in diameter but there was no evidence of biliary tract disease. A cystoduodenostomy was performed. After decompression of the cyst the biliary tract drained freely through the ampulla of Vater. All laboratory studies returned to normal and the patient has remained well for 6 months.

Comments: When this patient was first seen with jaundice he was thought to have a pancreatic pseudocyst. Both the jaundice and the mass disappeared spontaneously and absence of a cyst was confirmed at operation for the abdominal aortic aneurysm. Subsequently the sequence of epigastric mass and jaundice recurred and a pancreatic cyst was confirmed at operation. Disappearance of the jaundice following decompression of the cyst indicated that obstruction of the common duct was due to its compression by the cyst. In Warren's⁴ opinion, cystoduodenostomy is less satisfactory for decompression than cystgastrostomy because of the proximity of the common bile duct and gastroduodenal artery and also because the recurrence rate may be greater. We have decompressed pancreatic pseudocysts into the stomach, duodenum and less frequently the jejunum depending on the proximity of the cyst. Our experience does not suggest that results of decompression into the duodenum are less satisfactory than drainage into the stomach.

Case 6. L. S., a 53-year-old man, complained of diffuse abdominal and anterior lower chest pain, dark urine and increasing jaundice for two weeks. Excessive alcohol intake was denied. He was chronically ill and deeply jaundiced. The abdomen was tender in the right upper quadrant. Stools were acholic. The total serum bilirubin was 18.5 mg %, alkaline phosphatase 1400 IU, serum amylase 880 mg % and fasting blood sugar 100 mg %.

Operation revealed an 8 cm fluctuant mass in the head of the pancreas. The distal pancreas was normal. The common duct was dilated but the gallbladder was not diseased. A cystoduodenostomy was performed which did not decompress the biliary system. The common duct was explored and no stones were found. A T-tube was placed in the common duct and a cholangiogram revealed that the distal common

duct was compressed but patent. Postoperatively, the patient's bilirubin and amylase returned to normal values but he died on the thirteenth postoperative day. Autopsy revealed an intact suture line, chronic pancreatitis and severe, bilateral, aspiration pneumonia and pleural effusion. There was a subphrenic abscess.

Comments: The pseudocyst in this patient occurred with the first episode of pancreatic disease. In the two patients (Cases 5 and 6) with large pseudocysts, decompression of the pseudocyst immediately relieved the obstructive jaundice in the first patient but not in the second. Two additional patients (Cases 2 and 3) had small cysts, 30 and 25 ml respectively. In one of these patients, decompression of the small cyst was adequate to relieve the obstructive jaundice. In three series of pancreatic pseudocyst Waugh⁵ reported 5 of 58 cases, Warren⁴ none of 118 cases, and Thomford³ two of 50 cases in which obstructive jaundice was due to compression by a pseudocyst. These data suggest that in a group of patients with pancreatic pseudocysts, the number of patients with obstructive jaundice is small whereas of those patients with obstructive jaundice secondary to pancreatitis without cholelithiasis, the number with pancreatic pseudocysts is high.

Postoperative Acute Pancreatitis

Case 7. J. H., a 33-year-old man, underwent operation for duodenal ulcer disease that had been present for 10 years.

The duodenum was severely scarred and the ulcer penetrated into the head of the pancreas. The pancreas was otherwise normal. The liver, gallbladder and common bile duct were normal. A truncal vagotomy, antrectomy and a Billroth II anastomosis were done. The patient developed a duodenal fistula and became jaundiced postoperatively.

The patient was reexplored on the ninth postoperative day. The entire pancreas was edematous and there was extensive saponification of fat. The common duct and gallbladder were distended but no injury to the common bile duct had occurred. A cholecystostomy was performed and the duodenum and pancreas were drained. The patient subsequently died following a third operation required to drain a large subhepatic abscess involving the head of the pancreas and a second abscess near the tail of the pancreas.

Comments: Postoperative pancreatitis is a recognized complication of gastric surgery. In one series of 70 patients with postoperative pancreatitis, 17 patients, 5 of whom died, developed pancreatitis following gastric resection. The association of obstructive jaundice with postoperative pancreatitis was not mentioned. Our patient developed jaundice in the immediate postoperative period due to compression of the intrapancreatic portion of the common bile duct by edematous changes in the head of the pancreas. Although it did not occur in this patient, the cause of jaundice immediately after a difficult duodenal dissection is more likely the result of injury to the common duct than to pancreatitis.

Discussion

A primary diagnosis of chronic pancreatitis in older individuals who have no history of alcoholism and whose

symptoms are of short duration cause the surgeon concern because of the possibility of pancreatic cancer. When obstructive jaundice is also present the concern for cancer is even greater. Jaundice that occurs in association with pancreatitis is usually of intrahepatic origin or related to choledocholithiasis. Extrahepatic bile duct obstruction due to pancreatitis is infrequently considered in the differential diagnosis of jaundice because it is so uncommon. It is not surprising, however, that jaundice occurs on this basis and it is difficult to understand why the dense fibrosis and edema that occur in the head of the pancreas do not cause obstructive jaundice more often.

The possibility that both pancreatitis and cancer may coexist creates a difficult therapeutic problem for the surgeon treating a patient with painless obstructive jaundice. Some surgeons are of the opinion that biopsy of the pancreas has little role in making the therapeutic decision at operation, while others believe that histological confirmation is required before performing pancreaticoduodenectomy for suspected cancer.

The risk of a needle biopsy of the pancreas introduced through the two walls of the duodenum in patients with jaundice is not great. It is, therefore, a warranted procedure if lymph node biopsies are negative and the diagnosis is in doubt. If the patient has pain associated with jaundice and the surgeon is concerned that unproven cancer is present, the decision to resect is not difficult because pancreaticoduodenectomy is good treatment for painful chronic pancreatitis even though cancer is subsequently not found. However, if cancer is presumed to be absent, there are other surgical alternatives, that may be used in a given patient more easily and safely than pancreaticoduodenectomy when acute and chronic inflammation are present and pain is absent. The operation of choice in patients with common bile duct obstruction is based on the necessity to provide adequate drainage of the biliary tree and the pancreatic duct to relieve pain and to preserve as much pancreatic tissue as possible. The precise operative approach to follow in a given patient must be determined at operation.

The difficult decision is whether to resect the pancreas when (1) jaundice is present (2) there is a tumor confined to the head of the pancreas (3) there is no positive diagnosis of cancer (4) and the patient has *no* pain. Undoubtedly an occasional mistake in judgment as to whether the pancreas should or should not be resected will be made. This is exemplified by our first patient who died from carcinoma of the pancreas 3 months after treatment for suspected benign disease. Gambill¹ reported that 3 of 26 patients who had extensive pancreatitis with jaundice as one of their initial symptoms also had carcinoma. Painless jaundice of the obstructive type is usually considered indicative of carcinoma of the head of the pancreas and our first patient proved this rule, yet two of our patients (Cases 3 and 4) who had painless obstructive jaundice, had chronic pancreatitis without carcinoma.

The anatomical basis whereby the common bile duct can become obstructed in the presence of pancreatitis is well known. Approximately 60% of all individuals have the distal portion of the common duct enclosed in pancreatic tissue. In the remainder, it lies adjacent and immediately posterior to the pancreas. It is easy to understand how obstruction of the common bile duct might result from distortion, stenosis, or compression produced by fibrosis, edema or cyst formation in the pancreas. These factors contributed to obstruction in each of the patients reported and the curious fact is that obstructive jaundice on this basis occurs so infrequently.

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